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## Short Communication

## Overview of rapid mitigating strategies in Singapore during the COVID-19 pandemic

W.C. Lee <sup>a,\*</sup>, C.Y. Ong <sup>b</sup><sup>a</sup> Sengkang General Hospital, Singapore<sup>b</sup> SingHealth Community Hospitals, Singapore

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## ABSTRACT

This article describes the rapid mitigation strategies in addressing the rising number of coronavirus disease 2019 (COVID-19) cases in Singapore. Learning from the severe acute respiratory syndrome experience in 2003, early preparation started in January 2020 when Wuhan was declared as the epicentre of the epidemic. The government had constructed a three-pronged approach which includes travel, healthcare and community measures to curb the spread of COVID-19.

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Singapore confirmed its first coronavirus disease 2019 (COVID-19) case on January 22, 2020. At the time of writing, the cumulative number of cases in Singapore had exceeded 22,000. This article describes the preparations and rapid mitigation strategies in addressing the rocketing number of COVID-19 cases in the country (see Fig. 1).

**Travel-related measures**

Learning from the painful severe acute respiratory syndrome (SARS) experience in 2003, early preparation started in January 2020 when Wuhan city was declared as the epidemic epicentre. Border control measures were placed as early as January 2 when the Ministry of Health (MOH) issued a health advisory and implemented temperature screening for passengers arriving from Wuhan. This was gradually tightened with restrictions extended to Hubei province and then mainland China in conjunction with declaration of the outbreak as a 'Public Health Emergency of International Concern' on January 30. On Singapore's end, the public was advised successively against outbound travel to Hubei, China and subsequently Daego and Cheongdo counties in South Korea as

cases in these regions multiplied. Expatriation of Singaporeans from Wuhan was carried out with stringent quarantine and severe acute respiratory syndrome coronavirus 2 testing measures.<sup>1</sup>

Bilateral agreements were also made with the Malaysian government in February to align screening protocols at land borders. A joint field epidemiology training network to share surveillance data was activated. This had led to identification of the first international cluster in Singapore resulting from a global business conference. Stricter travel controls in Singapore and worldwide were imperative as early studies had confirmed that the mean  $R_0$  for COVID-19 is around 3.28.<sup>2</sup>

By early March, travel restrictions were extended to Iran, South Korea, Japan, Italy, Spain, France, Germany and the United Kingdom. These restrictions were implemented before the World Health Organization announced COVID-19 as a 'pandemic' on March 11. Further enhancement took place when Stay-Home-Notice (SHN) was issued to all overseas travellers on March 20. All travel restrictions and 'isolation' orders were capped at the standard 14 days based on the COVID-19 incubation period.

**Healthcare and hospital measures**

At the healthcare level, the MOH and National Centre for Infectious Diseases jointly developed guidelines on management of case suspects, which were disseminated to hospitals, physicians and laboratories in January.<sup>3</sup> After the first confirmed case, contact

\* Corresponding author. Department of General Medicine, Sengkang General Hospital, 110 Sengkang East Way, Singapore, 544886.

E-mail addresses: [deanna.lee.w.c@singhealth.com.sg](mailto:deanna.lee.w.c@singhealth.com.sg) (W.C. Lee), [ong.chong.yau@singhealth.com.sg](mailto:ong.chong.yau@singhealth.com.sg) (C.Y. Ong).



LOA were able to briefly leave their residential properties for food, groceries and 'important personal matters'. Revocation of permanent resident status, cancellation of work passes, fines and jail sentences were among the outcomes of those breaching the laws.

Closure of places commenced from places of worship to entertainment services and tuition centres. Business continuity plans for companies kicked off with staggering of work hours at workplaces. Food and beverage industries were advised to comply with safe distancing measures. As part of crowd-limiting measures, fixed seats in eateries, buses and trains were marked as not to be occupied. Fines were imposed for failure in abiding by safe distancing—serving as a reminder and deterrent to the public.

As the number of cases rose rapidly, reciprocating measures were implemented promptly. The announcement of the circuit breaker (partial lockdown with elevated safe distancing measures and movement restriction in public and private places) on April 4 suspended non-essential services and led to school closures. This endeavour corresponded to lockdowns and movement restrictions in many other countries.<sup>8</sup> As the measure did not show satisfying results in the initial two weeks, a four-week extension of this order was announced on April 21 along with tighter community measures such as closure of more work premises and controlled access to crowded places.

Singapore saw the number of confirmed COVID-19 cases surge in early April 2020 after the identification of several foreign worker dormitory clusters. These workers were housed in mega-dormitories with a capacity of up to 13,000 occupants, where they lived in close proximity and shared communal facilities. They also gathered in large groups at workplaces and public spaces during rest days. The high-density living between the 180,000 workers meant that they were always at risk of promoting transmissions. A special taskforce was formed to curb the spread in dormitories and to ensure the workers' well-being. The taskforce locked down dormitories with infection clusters, isolated those symptomatic and moved some of the workers to new accommodations. Strict hygiene measures, sanitization and safe distancing measures were adopted. Medical support was deployed to these dormitories for early and extensive testing, isolation and treatment.

Several quarantine and isolation facilities have been repurposed as early as January to contain the ever-increasing number of cases, but these facilities were inadequate. Many public venues worldwide have been converted to isolation facilities for patients with mild to moderate COVID-19 as the demand exceeded hospitals' surge capacity.<sup>9</sup> Resorts and convention centres (with a combined capacity of more than 10,000 at the time of writing) have been converted to house stable patients with mild symptoms of COVID-19. The healthcare workforce has also been deployed to these community facilities. As the number of COVID-19 cases continues to rise, the government has been working relentlessly on another makeshift facility at a shipping terminal with the capacity for 15,000 patients and will be sourcing other avenues, including cruise ships.

With the current circuit breaker in place, the highest number of cases per day was 1426. Ever since the peak, the mean number of

cases dropped to 681 at the time of writing. Local community cases and cases among foreign workers in dormitories peaked at 116 and 1371, respectively, per day and dropped to an average of 9 and 658 cases, respectively, per day.<sup>10</sup>

While some would debate on the tardiness of certain measures being implemented, we opined that careful and thoughtful planning with successive rapid executions has been carried out to balance the profound impact of the socio-economic activities and the healthcare system.

## Author statements

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### Competing interests

None declared.

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